

THE
PSYCHOLOGICAL BULLETIN

PSYCHOLOGICAL PROGRESS IN 1906.

BY PROFESSOR EDWARD FRANKLIN BUCHNER,

University of Alabama.

If a science exists in the making, our most recent year presents psychology as 'transitional.' If, on the other hand, the net results of endeavors constitute a science, then psychology may be equally regarded as 'substantive.' One is free to his own choice, for the year has been a quiet one. Free from the bustling activity of its immediate predecessors, it may in the long run prove as valuable as they. In any event the psychologist must live through the quiescent seasons as well as those of strenuous interest. He has probably produced his books, he has filled his technical journals with unfailing regularity, and he has contended in the forum of his associations. We should expect some effects of a rhythmical character to appear here in the wider aspects of a chronological unit, as well as in the activities of an individual organism. There are 'ups' and 'downs,' 'ins' and 'outs' in the psychological years. This appeared in the account, prepared some time since, of psychological progress within a restricted field.¹ And 1906 appears as a period in which the psychologist has possibly been resting after a season of tension; or, better still, let us hope, taking breath for a later increased activity.

Two features of the year may be said to stand out plainly, even if they do not eventually prove to become historically characteristic. In view of the recent efforts of the great dictionary makers, both technical and general, it is a bit surprising to find a rising tide of dissatisfaction threatening to engulf some of the 'older' (and almost consecrated) terms in psychology. The recent dispositions made of 'consciousness' are closely followed by a confessed willingness to see such terms as

¹ 'Ten Years of American Psychology,' in *Science*, N. S., Vol. XVIII., pp. 192 ff., 233 ff.

'feeling,' 'sensation,' 'perception,' and others disappear entirely from the language of the student of human experience.¹ Oddly enough, too, new terms are not at hand nor suggested to replace those now worn thread-bare by long usage. Might they have fallen into contempt by reason of too great familiarity? This tendency may be presaging the advent of the framer of the vocabulary of psychology for the new twentieth century!

Being synchronous with another tendency accentuated during the year, it probably should receive its interpretation in the light of the latter. The second feature is not a property peculiar to the year, but is the fruition of a tendency or partial point of view which has been accredited to the science for some time. The genetic method has been wielding an influence shaking up the old distinctions; but not until the period under review has there been such a transversing of the whole psychological field solely by its intellectual right and its scientific authority as that made by Baldwin's *Thought and Things*.² This is more than a tendency: it promises a complete reconstruction of psychology and also of the cognate philosophical disciplines of logic and epistemology, leaving the time-honored distinctions far behind. The immediate program of this volume and its companions soon to follow is, to be sure, restricted to the range of cognitive experience, but to the entire range of such experience. The success of this effort 'to put a consciously genetic method through the entire structure of cognition from the simplest to the most developed mode,' can of course but lead to a similar treatment of the remaining fields of psychological interests. The apperceptive use of 'logic' (cf. pp. 15, 33) will probably lessen the credit of psychology arising from this undertaking, if it does not lead to definite misunderstanding of such an application of the method of genesis. The achievement can be interpreted as an age-movement, and be closely related to the current intellectual *need* which has been finding widespread satisfaction in pragmatism. The item of historic interest is that the initiative has come from within psychology, and the results stand closer to the assured gains of the science than do the deviations towards the quasi-metaphysics of the times. Such a work as this may well check much of the current fruitless analysis of

¹ See, e. g., the discussion at the Cambridge (Mass.) meeting, 1905.

² *Thought and Things. A Study of the Development and Meaning of Thought, or Genetic Logic*. Vol. I.: *Functional Logic, or Genetic Theory of Knowledge*. London, 1906. The more complete engrafting of the genetic method in current thinking is well indicated by the demand for new editions of the same author's two volumes on *Mental Development* which have just appeared.

prepositions and conjunctions which are supposed somehow to be the points of intellectual approach in our 'fluid' experience. This 'between-things' philosophy has rapidly become ultra-psychological in its extreme individualism, not to say non-social. The genetic orchestra, to speak in terms of Lotze's well-known critical despatch of all theories of knowledge, being tuned up will at last give us a number, and permit us to enjoy the music of thought.

The attitude of the psychologist towards his subject-matter seems to be less a question for debate or a theory for elaboration than formerly. In spite of the fact that the functional point of view seems to have almost completely won out, there continue efforts to be even more precise in the application of criteria to consciousness. Ostwald, for example, in his Cambridge address on 'Psychical Energy' presents a restatement of his doctrine of energism in psychology. The value of a chemical philosophy for psychology is made to appear in the application of energy, our 'best and largest concept,' to the equation which consciousness seems to require. Every mental process takes up and consumes chemical and physical energy which otherwise disappears in a man's make-up. 'As this theory is the only one which opens a way to connect the inner and the outer world by a functional relation, it has a distinct advantage over the theory of psycho-physical parallelism, which is no theory at all, but only an arbitrary declaration that no such functional relation exists.' Another effort which remains more pertinently within the field of psychology and thus is the more to be commended, is an analysis of the fundamental functions of consciousness made by Warren.¹ In order to avoid the partiality inevitable in the over-emphasis placed upon 'special adaptations to the environment in which conscious beings chance to be placed,' he looks upon sensibility, modification, differentiation, association and discrimination as basal functions 'to whose operation every phenomenon of consciousness can be traced.' A possible feature of such an analysis is a more vital reunion of the analytic and genetic standpoints. There can indeed be only one result from this general 'methodological' clearing of the field which has attracted so much attention of late, and that will be to give psychology greater integrity as an independent science.

The physical conditions of conscious activity have been allowed to rest without much scientific disturbance. Flechsig continues his physiological interest in psychology, albeit in his one-sided way.² He

¹ 'The Fundamental Functions of Consciousness,' *PSYCHOLOGICAL BULLETIN*, July 15, 1906.

² 'Hirnphysiologie und Willenstheorien,' in *Annalen der Naturphilosophie*, 1905, Heft 4.

reaches the position that the volitional processes have their exact localization in the cortex and, more explicitly, in the motor areas. A certain heterodoxical innovation has been suggested by Stern in his mechanics of motor control.¹ All neural impulses being centripetal, and the central motor ganglia having certain powers of resistance against peripheral energies, it is suggested that muscular relaxation occurs when the cortical resistance is 'high' and contraction takes place when the resistance is 'low.' Dearborn has denied 'the hereditary *ex cathedra* supposition that the brain is the sole correlate of the mind,' and presented 'the claims of muscular protoplasm for consideration as representing a part of the mental process.'² This is a detailed reading-back into anatomical terms what psychology has contended for for some time respecting the organizing effects in experience of the motor processes. Auerbach thinks he has localized 'musical talent' in the cerebral region by specifying the supra-marginal and -temporal gyri.³ An attempt to settle certain questions of race psychology through the physiological mode of approach is made by Bean.⁴ "The white and the black races are antipodal in cardinal points. . . . The Caucasian and the negro are fundamentally opposite extremes in evolution." Head, Rivers and Sherren have utilized an interesting and profitable mode of analysis of sensory elements, with special attention to skin and pressure sensations not normally recognized.⁵ By a careful study of peripheral nerves under conditions of injury and division, they seem to find several systems of sensory mechanism in the return of normal sensibility after the slow subsidence of the traumatic effects. These results might lend themselves to genetic analysis as well.

It need not be regarded as historically unusual if vision continues, as it does, to occupy the center of interest in our laboratories. It is visual movements rather than other forms of optical conditions of experience which seem to be concentrating the efforts of our experimenters. The outgrowth of much of this current activity may appear in a very manageable form in the new manual on 'The Psychology of Stereoscopic Vision' announced by Jastrow. A very simple device by McDougall offers something that may improve the investigation of fatigue and recuperation.⁶ Among its virtues is the double claim that

¹ *Die pseudomotorische Funktion der Hirnrinde*, 1905.

² 'The Relation of Muscular Activity to the Mental Process.' See *PSYCHOLOGICAL BULLETIN*, 1906, p. 41.

³ *Archiv für Anat. u. Phys.* (Anat. Abth.), 1906, pp. 197 ff.

⁴ 'The Negro Brain,' *Century Magazine*, Sept., 1906.

⁵ 'The Afferent Nervous System from a New Aspect,' and 'The Consequences of Injury to the Peripheral Nerves in Man,' *Brain*, 1905, pp. 99-338.

⁶ 'On a New Method for the Study of Concurrent Mental Operations and of Mental Fatigue,' *British Jour. of Psych.*, 1905, pp. 435 ff.

it secures a 'graphic record of any failure of continuity of voluntary attention, and an objective measure of the accuracy' with which any given test has been performed. How patiently experimental methods must proceed, and how meagre their results, in an analysis of the conditions of 'learning,' may be seen, for example, in Brown's study of the processes of addition, subtraction, multiplication and division.¹ One of our great desiderata is an efficient psychology of learning; and laboratory coöperation, if not inter-laboratory organization, could with profit take a turn at tracing out this unique response to cognitive situations in mental development.

One current interest in feeling has already been indicated. The theory of emotion has commanded a certain amount of attention, and, oddly enough, with respect to the validity of the James-Lange theory. D'Allonnes has reported a case of visceral anæsthesia where the emotions were absent but the external expression of them was present.² The case suggests to the author a modification of the James-Lange view so as to regard 'internal sensations alone affective and essential to emotional life.' Sollier has in recent years shifted from an earlier acceptance of the peripheral theory of the emotions, and now advances a central theory, which is mechanical and physical in character. Emotion is 'the diffusion of energy, transformed and liberated by the brain in the brain itself, and the absorption of this energy by the brain' at the expense of the effective work for which it was destined.³ His material is derived chiefly from his study of hysteria. Lagerborg, on the other hand, closely follows the James-Lange theory, in fact descending a little lower in the physiological scale, if one might so speak, and regards emotions as 'repercussions due chiefly to nutritive reactions.'⁴

The field of psychological æsthetics has been credited with two rather widely divergent contributions, which show indeed the extensive applications of the psychological spirit and its varied methods. In the 'Fechner Number' of the PSYCHOLOGICAL REVIEW,⁵ Miss Martin shows a sustained application of experimental inquiry to the notable æsthetical principles laid down by Fechner in his *Vorschule*. In the recent addition of the first part of the second volume to his *Völkerpsychologie*, Wundt well indicates how the fields of anthropology and

¹ 'The Psychology of the Simple Arithmetical Processes,' *Amer. Jour. of Psych.*, 1906, pp. 1 ff.

² 'Rôle des sensations internes dans les émotions et dans la perception de la durée,' *Revue Phil.*, 1905, pp. 592 ff.

³ *Le mécanisme des émotions*, 1905.

⁴ *Das Gefühlsproblem*, 1905.

⁵ Vol XIII., No. 3, May, 1906.

sociology may be reconstructed in the hands of a master in psychology. In accounting for the organization of the mythical and religious creations (chiefly the former) in the racial beginnings, two positions are made dominant. Primitive tendencies of these types are viewed as on a level with the processes of perception in individual psychology, and are explained by means of imagination. Myth-making is identical with the process of sense-perception. 'Primitive man,' so long an unknown or an abstract quantum or qualis to science, is therefore not left a somewhat which has become archaic, and thus archeological. To the skeleton of this bold theory, flesh and blood are given by his adoption of *Einfühlung*—the current æsthetic theory. His application of the 'feeling-in' or sympathetic process is doubtless a definite extension of this æsthetic principle.

Individual psychology, which has been attracting more and more attention and greatly improving in the value of his judgments in consequence of the more careful sifting of data and the more adaptable refinements of statistical methods, has within the year received a marked contribution. The appearance of the *Biographical Directory of American Men of Science* early in the year has been closely followed by a careful interpretation of its data by its editor.¹ Cattell has been more fortunate in the selection of his data than either Ellis,² or Woods,³ and the results of his treatment of them therefore occupy a higher level both as to probability and pertinency. Out of the four thousand scientists in America listed in the *Directory*, psychology claims one hundred and ninety-two, or only 4.85 per cent. Of the one thousand whose meritorious performances are studied, fifty are assigned to psychology, being 5.00 per cent. This gain might suggest the greater worth of performance when it is in the field of our science. Of the twelve scientific groups, psychologists are the most segregated, only two having been assigned 'positions' in other sciences. This is not to be regretted if it may be taken as a sign of astute devotion of the American psychologist to his *Fach*. As a measure of ability, these studies are by far the most interesting we have, and future psychology will eagerly await the projected comparison with scientific performance among other nations.

Genetic and social psychology seem to be setting up a new house

¹ 'Statistical Study of American Men of Science: I., The Selection of a Group of One Thousand Scientific Men,' *Science*, Nov. 23, 1906, pp. 658 ff.; 'II., The Measurement of Scientific Merit,' *Ibid.*, Nov. 30, pp. 699 ff.; 'III., The Distribution of American Men of Science,' *Ibid.* Dec. 7, pp. 732 ff.

² *A Study of British Genius*, 1904.

³ *Mental and Moral Heredity in Royalty*, 1906.

together. And, if one mistake not the signs of current discussions, the progeny will stand forth accredited to a new moral psychology, or the mental evolution of the moral attitude. There is already a large amount of raw material scattered in these provinces and in the adjacent region of religious psychology.¹

Comparative psychology has been greatly enriched by Jennings's final statement of the work he has been doing on the lower structures.² Its worth does not reside in the light it may throw upon the question of the ubiquitousness of consciousness in these minuter structures, but rather in the consistent check it will probably give to the further pursuit of the theory of invariable reflexes or tropisms. The attitude of Jennings is fruitfully different from that maintained by Pavlov in his recent Huxley Lecture,³ his contention being that physiology has been advancing by borrowed light, the explanatory ideas of psychology, — a source 'of evil influences.' One reason for anticipating in the early future better psychological knowledge of animal behavior may be found in Claperède's answer to the sceptical biologists.⁴ Another may be found in the rapidly increasing number of students in this field.

As in former years, one may turn to the *Psychological Index* for a quantitative estimate of directions taken in developing different psychological interests. The following table is based upon the *Indexes* for 1904 and 1905.

1904.		1905.	
No. of Titles.	Rubric.	No. of Titles.	Rubric.
751	Sleep, trance and pathology.	482	Higher manifestations of mind.
541	Genetic, individual and social psychology.	477	Sleep, trance and pathology.
539	Sensation.	473	Genetic, individual and social psychology.
478	Higher manifestations of mind.	428	Sensation.
362	Anatomy and physiology of the nervous system.	270	Anatomy and physiology of the nervous system.
269	General.	228	General.
206	Conation and movement.	135	Conation and movement.
165	Cognition.	128	Cognition.
93	Characters of consciousness.	67	Characters of consciousness.
41	Affection.	39	Affection.
3,445		2,727	

¹ Cf., e. g., Tufts, 'On Moral Evolution,' in the Garman *Festschrift*, *Studies in Philosophy and Psychology*, 1906, Westermarck, *The Origin and Development of the Moral Ideas*, 1906, and Davenport, *Primitive Traits in Religious Revivals*, 1905.

² *Behavior of the Lower Organisms*, 1906.

³ 'The Scientific Investigation of the Psychical Faculties or Processes in the Higher Animals,' at the Charing Cross Hospital. See *Science*, Nov. 16, 1906, pp. 613 ff.

⁴ 'La psychologie comparée est-elle légitime?' *Arch. de Psychol.*, 1905.

The literary output of the year 1905 shows a loss of twenty per cent. from that of the preceding year. The last six rubrics retain the same rank. The first three of the 1904 order each drop one position in 1905. Aside from this shift, there is only one real change in the relative values indicated by the table: 'higher manifestations of mind,' (facetiously almost!) passes from the fourth to the first position. As pointed out above, this year has been quieter and more steady than last year. Our table carries this trait back a year earlier. But even this gross quantitative measure, which equates books, monographs and articles, good, bad, and indifferent, is suggestive as showing that psychology is maintaining either a proportionate, or a dead level of interest.

Another quantitative estimate, limited to America, is found in the report of 'Doctorates Conferred by American Universities.'¹ During the period of the last nine years psychology as a productive university study is in a class with physics and zoölogy; 124 doctorates have been conferred in psychology, 128 in zoölogy, and 133 in physics. Chemistry, with 282, heads the list and constitutes a class by itself. If certain economic values explain the position of chemistry, others may at least in part be applicable to the second class — thus hinting at the relatively high rank which psychology takes in the 'economy' of culture and education as worked out in our growing system of schools.

The appearance of the long-promised bibliographical section of the *Dictionary of Philosophy and Psychology*,² compiled by Rand, was a notable event. The literatures of these cognate fields are now within the grasp of the reader as never before, and the current additions to bibliography will tend to favor a better grade of scholarship in these departments of knowledge, and possibly check some of the rush 'to print.' The creation of new journals does not give much encouragement to such a hope. The forty-volume old *Zeitschrift für Psychologie und Physiologie der Sinnesorgane* has divided into separate issues, the one for psychology, edited by Ebbinghaus, the other for sense physiology, edited by Nagel. Dessoir is editing the new *Zeitschrift für Aesthetik und allgemeine Kunstwissenschaft*. Abnormal psychology possesses two new channels for publication: the *Journal of Abnormal Psychology*, edited by Prince, and the serial *Klinik für psychische und nervöse Krankheiten*, edited by Sommer. Argentina presents the new *Archivos de Pedagogia y Ciencias afines*, edited by Mercante, and Italy has added to its growing list of periodicals the

¹ *Science*, Aug. 17, 1906, p. 208.

² Vol. III., Parts I. and II., *Bibliography of Philosophy, Psychology and Cognate Subjects*, 1905.

Rivista di Pedagogia, edited by Dedominicis. A new publication is promised, *Zeitschrift für angewandte Psychologie und psychologische Sammelforschung*, to be edited by Stern and Lipmann, as the special organ of the new 'Institute' established at Wilmersdorf (Berlin) by the young *Gesellschaft für experimentelle Psychologie*. This movement is interesting, offering, as it does, the program of a central station and museum for psychological research. It appears that a somewhat similar action is imminent in Paris in the proposed General Institute of Psychology, to be devoted however to the study of subconsciousness, criminality, and allied topics. The lighter side of psychology is added to by the organization of the *Deutscher Monistenbund* at the Zoölogical Institute at Jena, Haeckel being the honorary president — a certain expression of the social instinct in matters philosophical.

The educational interests and the personnel of psychology have also contributed their modest part to the work of the year. The University of Edinburgh created the George Combe Lectureship in general and experimental psychology, with a laboratory, to be maintained by trust funds set apart by the author of *The Constitution of Man*. Thus the phrenologist of a former age — a type of scientist *then* in good repute — benefits both now and in the future the newer science of man. The New Jersey Training School for Feeble-Minded Girls and Boys has established a 'research department,' which makes a beginning in a new field. The new year has recorded the admission of Italy into the American educational alliances which have become rather characteristic in recent years. This exchange of professors seems to show that the printed page, either in the original or in a translation, is probably a most inadequate means for the expression of the personality of the expert. The lecturing visits of Ostwald, of Leipzig, and Janet, of Paris, to several American universities during the year credited the theoretical interpretations and therapeutical applications of psychology, as indicated by their respective themes: 'The relation of energy to life and thought;' and 'The symptoms of hysteria.' More and more do we find psychology becoming a thrifty child in the family of the sciences and feeling itself at home in the world of varied human interests.

AN IMPROVED EXPOSURE APPARATUS.

BY PROFESSOR RAYMOND DODGE,

Wesleyan University.

No psychological instrument is subject to greater modification in response to special experimental conditions than exposure apparatus, and few of our instruments have assumed a greater variety of forms. Uniformity is doubtless impracticable. Yet, in publishing a new type, I am influenced by the belief that a simple apparatus, which satisfies the most exacting experimental requirements of a satisfactory tachistoscope, while it permits the widest variation of illumination and exposure time, will not be unwelcome.

The apparatus was designed to satisfy all the conditions of satisfactory exposure which were developed by Erdmann and Dodge in their *Psychologie des Lesens*, together with some additional conditions indicated by more recent work. These requirements may be summarized as follows: (1) In order to correspond with normal vision, and to prevent the irregular complications which may at any time arise from the partial exposures involved in every successive exposure, the exposure of the entire object should be rigorously simultaneous. (2) Since, in actual tachistoscopic experimentation, the threshold is determined not only by the length of the physical exposure, but also by the physiological preponderance of the exposure over the pre- and post-exposure fields, the relative illumination of the various fields should be capable of experimental modification. (3) The primary fixation point in the pre-exposure field should be capable of accurate adjustment with relation to the object of exposure, so that the point of fixation during exposure may be accurately predetermined. (4) The duration of the exposure should be subject to wide variation without altering the other experimental conditions in any way. The exposure should be noiseless and without distracting phenomena of any sort. (5) The apparatus should be capable of adjustment for either monocular or binocular observation, or for any combination of the two that may be desirable. The present apparatus makes it possible to have a binocular exposure with a monocular pre-fixation or *vice versa*.

All the forms of exposure apparatus with which I am acquainted

depend on one or more of four general principles: The object may be moved into the field of view. It may be uncovered by a moving screen. An image of the object may be projected by a system of lenses. Or, finally, the object may be exposed by momentary illumination. The transparent mirror apparatus, herein described, depends on the principle of momentary illumination, but it corrects the chief defect in previous apparatus of the same type by providing a suitable pre- and post-exposure field. This provision was developed from the general principle that a glass plate is transparent when the illuminated object lies behind it, while the same plate functions as a mirror when the illuminated object lies in front. The principle is familiar enough in color mixers of various sorts. The problems of construction were to arrange for the placing and illumination of the two objects, and to eliminate the troublesome secondary reflection from the rear surface of the glass plate. The latter problem was finally solved by the use of smoked glass for the transparent mirror. The accompanying diagram indicates the arrangement of the instrument now in use. It is a kind of dark box. The objects are inserted through slits in the sides at O^1 and O^2 . They are illuminated by windows at $W^1 W^2$. The hood shows the position of the observer. Between the observer's eyes and the object to be exposed, a plate of smoked glass TS stands at an angle of 45° to the line of vision. During the exposure of the object, *i. e.*, when O^2 is illuminated, the glass plate serves no purpose whatever. It is simply a part of the transparent media between the eye and the object of regard. Before and after the exposure, on the other hand, *i. e.*, while O^2 is dark and O^1 is illuminated, the glass plate functions as a mirror. It reflects the entire field at O^1 in such a way that the latter appears to lie in the same plane as the exposure field O^2 , directly in front of the observer. If both fields O^1 and O^2 are illuminated at the same time, both are visible at once and appear to occupy the same position in space.

The adjacent windows $W^1 W^2$ provide for the admission of light into the apparatus and consequently for the illumination of the fields $O^1 O^2$. The pre- and post-exposure field (O^1) receives its illumination through window W^1 . The exposure field (O^2) receives its illumination from the other window W^2 . The light from each window falls immediately on a silvered mirror $M^1 M^2$, from which it is reflected at an angle of 90° to the appropriate field. Diffusion within the apparatus is reduced to a minimum by the partitions $SSSSS$ which are provided with openings only just large enough to give a satisfactory view of the two fields. The windows $W^1 W^2$ are glazed with ground

glass to insure an even distribution of light, and are provided with paste-board diaphragms to regulate the intensity of illumination. Between the windows and the source of light some sort of shutter must be

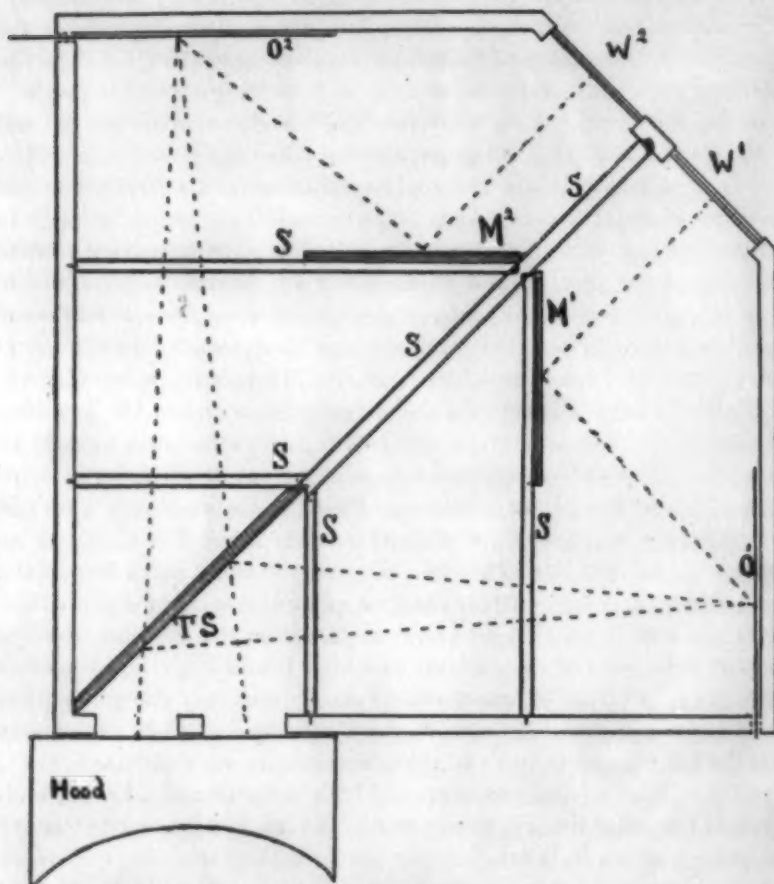


Diagram of transparent mirror exposure apparatus.

$W^1 W^2$. Windows glazed with ground glass.

O^1 . Pre-exposure field.

O^2 . Object to be exposed.

TS . Transparent mirror.

$SSSS$. Screens to confine the illumination to its proper object.

The dotted lines indicate the path of two parallel beams of light.

interposed which will shut off the light from the pre-exposure window W^1 at the same moment that it allows the light to fall on the exposure window W^2 . The form of shutter is altogether a matter of expediency.

In my own apparatus a large disk, carried on the axis of a heavy second-pendulum, is provided with adjustable sectors, which are so arranged that when one window is illuminated the other is darkened. The duration of the exposure is regulated by the size of the open sectors. Since, with a given source of light, the illumination of each field depends only on the size of the diaphragm in the corresponding window, it is quite independent of the illumination of the other field, and the relative illumination of the two fields may be modified to correspond with the most varied experimental needs.

The apparatus conscientiously satisfies the requirements for which it was designed, and in addition it permits a number of valuable adjustments which would have seemed unreasonable to have demanded in advance. The pre-exposure fixation mark together with the entire pre-exposure field disappears completely during the period of exposure and returns again when the exposure is over, without flicker, without observable transition time, and absolutely without motion. With a pendulum shutter between the windows and the source of illumination, there is no preliminary announcement of the exposure except such as may be voluntarily introduced. There is no stimulus for reactive eye movement. There is no instrumental ground for anticipatory reactions of any sort. On a well lighted field the exposed object simply appears for an instant in place of the primary fixation mark and disappears as suddenly as it came, without noise or any other disturbance.

The only inconvenience about the apparatus is the relatively high power illuminant that is needed to offset the waste of light within the apparatus. Excellent results are obtained with an incandescent electric light of high candlepower like the Thompson 150 c.p. stereopticon lamp, fitted with a large condenser to make the rays parallel.

Besides its use as a tachistoscope the instrument is a satisfactory device for color mixing, using either gelatine films or colored papers. It also readily adapts itself to the projection of after-images onto pre-determined post-exposure fields. The absence of all disturbing circumstances in the transition to the post-exposure field renders the apparatus unique.

It was recently called to my attention that the principle of the apparatus is freely used by sleight-of-hand performers to produce various illusions of disappearance and transformation. This seems to me rather striking testimony to its efficiency.

PSYCHOLOGICAL LITERATURE.

ANGELL'S PSYCHOLOGY.

Psychology: An Introductory Study of the Structure and Function of Human Consciousness. JAMES ROWLAND ANGELL. New York, Henry Holt and Company, 1904. Pp. iv + 402.

The present status of psychology in America, as regards its tendencies, standpoint and subject-matter, is well exemplified by this book. While it would be unfair to impute eclecticism to the author, since independence and critical thinking are apparent throughout, yet the substance of his writing represents a merging or perhaps better a synthetizing of a variety of standpoints. The author acknowledges the influence of James and Dewey. An influence which is apparent but which does not receive acknowledgment is the Wundtian and, to a lesser extent, that of Baldwin. Other elementary books have been written from the special standpoint of schools or systems, usually with the result that certain doctrines have been unduly emphasized and other views, equally essential, minimized or neglected. It would seem, therefore, that the unique value of this book, as well for the teacher as for the layman, would lie mainly in this catholic account that it gives of the attitude and achievement of the science at the present time.

As regards execution, the work has been well done both in the scope and arrangement of the material and in method of treatment and doctrine. The ground covered by the book is that subject-matter now usually included in elementary courses in psychology, viz., an account of the nervous system, habit, attention, sensation, perception, association, imagery, meaning, reasoning, affection, emotion, instinct and action. In one case only, in the opinion of the reviewer, does the author err in the selection of his material: chapter XVII., on the nature of the impulse, seems to him superfluous. It seems superfluous because the impulse, as used by the author, has no differentia (that the reviewer has been able to discover) that distinguishes it from instinctive and emotive experiences; secondly, because no new matter is introduced in the chapter.

For the arrangement of the subjects one has only commendation. In several ways it is excellent; for example, the grouping together, in chapter IV., of attention, discrimination and association; and again, the connected discussion of reflex action, instinct and emotion.

On the side of method of treatment there is, perhaps, always room for dissent. In general, the plan of the author is, first, to describe the structure of the consciousness that he is considering, afterwards giving an account of its genesis and of its function in the mental economy of the individual. Were this scheme consistently carried out, giving to each standpoint its due, without loss of proportion, the result would be beyond complaint. But as it is, in the present book one feels that the genetic and functional aspects of consciousness have been overdone at the expense of analysis. For example, in the analysis of memory (referring to the topic of that title, p. 185) the aspect that is stressed is that memory is a form of association. The characteristic marks of the memory consciousness, the dating and placing of the event and the warmth and intimacy of the experience, are not mentioned in the discussion of that topic.

Again, in the chapter on the consciousness of meaning one finds a similar lack of analysis, although in this case the difficulty of the matter itself may be responsible for the deficiency. The analysis (p. 210 and p. 215) reveals two points: (1) the existence of an image; (2) the use of the image to convey a definite meaning. What is one to understand by this statement? Surely there is imagery of some sort involved. There is also meaning. Does the author intend that we should understand that the *meaningness* is a unique mental fact invariably associated with verbal imagery? If that is his intention, one must admit that the fact of meaningness is left untouched. Similarly (pp. 210-212), the author criticises, with justness, the view that a composite image, if such a thing were possible, could constitute a meaning. The ground of the objection is that the image could not stand for all 'tables', for example, as our meaning of 'table' undoubtedly does. We must add to the image, whether it be generic or individual, the fact that it is a symbol. But, our objection is, the nature of this symbolism is precisely the whole matter of meaning. What is the relation of the meaning to the image? Is the meaning a unique content, or does it develop somehow from the image? How is meaning to be explained in terms of brain cells? The author touches on some of these points, but without, in the reviewer's opinion, making much headway. But even so, the author might reply, he has as much to say on this matter, and more, than many psychologists. It is unfortunate that the fact has been so largely neglected.

A critical discussion of the doctrines of the book would require too much space. It may suffice to mention the author's attitude on several debatable points. With regard to the question of the nativistic or

empiristic origin of the space consciousness, the author takes the stand that 'the crude, vague feeling of extension' is 'underived by mere experience from non-spatial psychical elements.'

On the other hand, the author is confident "that all accurate knowledge of the meaning of the space relations in our space world, all practically precise perception of direction, position, contour, size, etc., is a result of experience, and could never be gained without it" (p. 141). As to the parts played by the various senses in space perception, the author holds "that all forms of sensations are immediately *suggestive* of spatial attributes, *e. g.*, position, size, distance, etc.; but that sight and touch possess intrinsically and completely the full spatial characteristics" (p. 142). Again, in the matter of the number of affective elements, the author prefers "to abide by the older analysis of pleasantness and unpleasantness as the two modes of affection fundamentally distinct from sensation" (p. 259).

On the whole, and largely in detail, one may say that the book is excellent. It would, however, be much improved as an instrument for teaching psychology if the substance of the topics was more frequently summed up in terse formulæ.

H. C. STEVENS.

UNIVERSITY OF WASHINGTON.

RAND'S BIBLIOGRAPHY.

Bibliography of Philosophy, Psychology, and Cognate Subjects.

Compiled by BENJAMIN RAND, Ph.D., Harvard University. 2 Parts. New York, Macmillan Company, 1905. Pp. xxvi + 1192.

The two parts together form the third volume of Baldwin's *Dictionary of Philosophy and Psychology*. It is a work of laborious and painstaking scholarship, and Dr. Rand has laid the philosophical world under a debt of peculiar obligation for the service which he has rendered in this compilation. The first part consists of a short section devoted to a catalogue of philosophical bibliographies, dictionaries, periodicals and other collective material. The bulk of the volume, however, is given to a bibliography of the history of philosophy, including philosophers themselves, their works and works upon them. The second part covers the special subjects of systematic philosophy, logic, æsthetics, philosophy of religion, ethics and psychology.

It may seem perhaps ungracious to criticise work which is in the main so excellent and valuable. There are, however, several minor defects which are obvious even from a cursory glance through the twelve hundred pages. The finding of any special topic would have been greatly facilitated if some *guiding word* had appeared at the top

of each page. For instance, I open the first volume at random and find on page 170 the work: *Thompson, J. Arthur. History and Theory of Heredity*. One must look back to p. 166 to find the caption under which this book appears, which happens in this case to be that of *Charles Robert Darwin*. At the top of the page is merely the general title, too general to be a specific guide, *History of Philosophy*. Again, in giving the title of a book of special note, there is inserted immediately following it a supplementary list of the works which have been written upon the book in question. In this connection some indication should be more clearly given by spacing or other device as to where such parenthetical lists of books begin and end. It is not clear to the eye running hastily down the page; as, for instance, the appended list on *Hegel's Outlines of Logic*, on p. 663, or that on *Schleiermacher's Dialektik*, on p. 676.

Again, in the section at the beginning of Part II. on Systematic Philosophy there is no place in Dr. Rand's classification for the subjects of Empiricism and Rationalism, and no bibliography of these subjects given; at least I was able to discover none. Under the head of Logic, there is no reference to the subject of Classification. I afterwards discovered several works on Classification mentioned under the head of Method, but scattered here and there with no attempt to group them together. There should be a reference in the table of contents to so important a subject as that of Classification, and then a cross-reference to the subject of Method where the works on Classification in this bibliography are to be found. Under the same head of Logic, there is no reference to the theory of Statistics, or Statistical Method, and no mention of any works on this subject under the sub-head of Method. There is nothing under the heads of Nominalism, Realism and Conceptualism. I notice also some conspicuous omissions of important works here and there as I have happened to turn to certain topics as the result of a chance suggestion.

Under Evolution, there is no reference to Huxley's *Romanes Lectures on Ethics and Evolution*, or to De Vries' *Species and Varieties: Their Origin by Mutation*. Under Symbolic Logic, Lewis Carroll's *Symbolic Logic*, Couturat's *L'algebre de la logique*, the volume of Johns Hopkins Studies and the works of Frege are omitted. Under the head of Probability there is no mention of Venn's *Logic of Chance*, or Pearson's *Grammar of Science*, or the works of De Morgan, Quetelet, Galton, Poincaré, Bernouilli and De Moivre.

Under the head of Belief and Evidence, there is no mention of Balfour's *Defence of Philosophic Doubt* or of Greenleaf's *Treatise on the Law of Evidence*.

JOHN GRIER HIBBEN.

PRINCETON UNIVERSITY.

GARMAN COMMEMORATION VOLUME.

Studies in Philosophy and Psychology. Commemoration Volume by Former Students of CHARLES EDWARD GARMAN. Part I. Philosophy. Boston, Houghton, Mifflin and Co., 1906. Pp. 401.

The publication of this substantial and beautiful volume as an act of piety and gratitude on the part of the contributors and many other Amherst men, has a peculiar appropriateness because of the unique position which Professor Garman has long held among American teachers of philosophy. One ought not to say that Mr. Garman has given up to a college what was meant for mankind; but it seems evident that he has given up to his students time and personal gifts that, otherwise bestowed, might long since have yielded a much greater harvest of public recognition and outwardly visible results of labor. He appears — while possessing strong and distinctive philosophical convictions of his own — to have largely foregone literary production and the allurements of philosophical controversy in behalf of cherished causes, in order to devote all possible energy and thought to the perfecting of a method of imparting to young barbarians of undergraduate age something of the philosophic temper, a sense of the vital significance of philosophical problems, and some power of philosophizing. He has, like Socrates — ‘avoiding the public places and the forum, where, as the poet says, men acquire celebrity, and concealing himself from the public view’ — been willing to spend his life talking philosophy with a few boys in a corner; and he has shown a somewhat similar vocation for the noble and difficult art of intellectual midwifery. As a result Mr. Garman has become *par excellence* a specialist in the pedagogy of the teaching of philosophy; and the volume appropriately opens with a reprint of a letter (elicited some years ago by President Hall) in which the plan of the unique course in general philosophy at Amherst is indicated, with many original and fertile suggestions which no teacher of the subject can afford to overlook. It is especially fitting that such a teacher, who has quietly devoted the best of his time and thought and personality for a quarter of a century to his students — many hundreds of whom have in that interval passed through his courses — should be publicly honored by such a tribute of appreciation from them, and by the publication of selections from the work of those whom his teaching has led into the professional pursuit of philosophical studies.

Of the eight papers in the philosophical part of the volume, three might perhaps as fairly be classified as psychological; and one is a

study in statistics, albeit of decidedly philosophical bearings: a critical résumé, by Professor W. F. Willcox, of the evidence tending to the conclusion that the population of Europe has trebled in a century and a half, that the number of persons of European stock has increased nearly fourfold, that the contact of other races with European culture has (contrary to the usual belief) on the whole tended to the marked increase of the native stocks, and that consequently the population of the globe is probably half as great again as in 1750. The only discussion of fundamental philosophical issues is contributed by Professor Woodbridge, in a paper on 'The Meaning of Consciousness.' Where two or three philosophers are gathered together, a fresh refutation of idealism is now to be expected; and Woodbridge furnishes that feature of the present feast in an interesting piece of reasoning, that is, however, hardly likely to convince the unconverted. The argument is based upon the attempt (already made familiar by Woodbridge himself, as well as by James, Dewey, Perry and others) to eliminate from the notion of consciousness the dualism of 'subject' and 'object' which has hitherto been supposed to be of its essence — to define reality in its primary nudity (*i. e.*, stripped of the trappings furnished it by reflective reinterpretation) as 'pure' or 'immediate' experience, and consciousness merely as a kind of relation between the parts or ingredients of this universal mother-liquor. Woodbridge here, however, seeks to advance the argument a stage, by defining more precisely what sort of relation within experience consciousness is — *viz.*, that connection between experiences whereby one 'means' another — as, *e. g.*, water is that which 'means that it will quench thirst.' On the whole enterprise of these metaphysicians (which is important if successful) and on Woodbridge's contribution to it, certain remarks seem still pertinent. (1) The procedure of the argument consists in setting aside idealism by denying the dualistic antithesis of thought and thing in which the idealist's arguments find their point of departure. But it is not clear why the resultant identity should be called realistic any more than idealistic. If, as James declares, 'Thoughts are made of the same stuff as things are,' one is impelled to ask which stuff that is, or whether it isn't really either. When the proverbial two snakes reciprocally swallow one another, it seems mere fondness and partiality to call the resulting absence of snake by the name of either animal. (2) In reality, however, the relational theory of consciousness does not reduce thoughts and things to even a neutral identity, but is rather itself the seat of a pathetic internal disruption. For its logic makes straight for idealism, if not for the solipsism of the specious present, while the

cravings of its partisans seem to be all for a realism that may appear respectable in the eyes of natural science. True it is that in immediate experience *Gedanke* and *Gedachtes* are identical and indistinguishable; that there are just present 'facts.' But these facts are absolutely evanescent (or perhaps one should say, non-temporal); they have nothing in common with the explicitly projected and perduring 'things' of realism and common-sense. The existence of 'things' remains in the new doctrine just as purely inferential and external as ever. Relationism may show us, at any single moment, a mass of content, which may perhaps be called indifferently object or state of consciousness; it may show us also, in successive moments, a series of alterations of content; it may even (if we glide over certain logical difficulties) be supposed to show us relations and 'pointings' between these masses of content; but it has no warrant in its own principles for maintaining the existence of anything outside of the present mass of some specified moment. The 'pointings' must be wholly 'within experience.' But the essence of realism is the assertion that 'presence' is wholly unessential to real existence, and that there are entities that abide independently of those temporal shiftings and disappearances of elements that we know to be characteristic of all experience. How one can assert realism without reaffirming the dualism which the relational theory got its start by denying, is a mystery hard to understand. The paradox seems particularly glaring in Professor Woodbridge's case because he is, with one exception, the most emphatically realistic — in the old-fashioned way of realism — of all the representatives of the relational theory. (3) In the present study Woodbridge nowhere clearly defines the term 'meaning,' upon which all the novel part of his argument turns. The term is by no means luminous or unambiguous; and the illustrations of its import which are offered (p. 159) in lieu of a definition make it more rather than less difficult of understanding. Satisfactory criticism of the proposed addition to the relational theory is therefore hardly possible until the conceptions involved are set forth with greater fullness and definiteness.

Two studies, one chiefly phylogenetic, the other analytical, in the psychology of the moral consciousness are among the recent symptoms which encourage the hope that ethics, long a somewhat stationary science, is about to make some real progress and to learn the use of some new categories, through a more adequate investigation of the moral 'attitudes' and the processes of moral judgment as they actually occur. The first paper, by Professor Tufts (who has also served as chairman of the committee responsible for the editing of the volume),

gives a judicial and decidedly illuminating discussion of the results of recent work in psychology and anthropology that bear upon the order and upon the causal factors of moral evolution, with respect both to the 'form' and the specific content of morality. The paper is exceptionally well-balanced and comprehensive; but what seems to me the most important factor of all is precisely the one which it (like most studies in the subject) treats most inadequately. The peculiarity which above all makes man capable of morality surely is the fact that he is self-conscious and that he has certain quite special desires and cravings connected with his consciousness of self; that he is, *e. g.*, preëminently 'approbative,' desirous that his ejective self shall be thought of by others in a certain manner, shall be credited by them with certain predicates; and that, secondly, he is powerfully moved by the desire that he himself shall be able to think of that objective self of his as the legitimate subject of predicates that he instinctively admires, or has imitatively learned to approve, or at least not to disapprove, in others. It is upon these peculiar desires and emotions of the self-conscious, would-be-self-approbative animal, that society chiefly works in bringing about an increasing control of primary impulses by 'obligatory' moral imperatives. The genetic psychologist of the moral consciousness is, therefore, called upon first of all to trace the beginnings and early phases of self-consciousness, the origins and conditions of 'approbateness,' the transition from this to the desire to conceive of the self as being intrinsically approvable; to show the relations and interworkings of this and the other factors in moral control, and the particular kinds of moral 'content' that fit most easily into this 'form' of ethical thought and feeling at different stages of social evolution. Tufts by no means entirely neglects this aspect of the moral consciousness, but his treatment of it seems to me much too casual.

One of the important purely 'formal' elements in morality that depend entirely upon the dialectic of self-consciousness, is especially emphasized in Professor F. C. Sharp's careful and penetrating analysis of the moral judgment, *viz.*, its projection of all selves, including the agent's, into a cold and impersonal world, where all appear in the same light and are judged by the same standards, so far as the essential conditions under which they severally act are assumed to be the same. 'Moral approbation,' says Sharp, 'is differentiated from other forms of approbation by the fact,' not only that it has a peculiar object, but also that 'its grounds are such that they apply equally to every one who may be called upon to act in the same situation'; and one may add that, in certain phases of moral development, the addition

of new content to a current code of approbations and disapprobations is largely due to the pressure of this requirement of formal universality; what is first merely disliked (because of some unreflective feeling of sympathy or antipathy) in an act or characteristic of another, is presently found to be essentially analogous to something hitherto passed without censure in oneself or a third person; and it comes thereupon to be condemned in these latter cases also. The point is, of course, nowise new, but it is rightly declared by Sharp to be fundamental in any just account of the implications of the moral judgment as such. Less convincing is Sharp's statement of the other half of the differentia of the moral judgment; the primary specific mark of that judgment, he tells us, consists not in any special emotional concomitants, but in the object of the judgment, which is always 'the end that the agent aims to bring about.' But men seem to approve or disapprove (with the impersonal universality above mentioned) without any conscious reference to the 'aims' or 'purposes' of the agent; moral judgment seems more often, in fact, to be interested in acts as expressions of qualities of personality or temperament, and as indications of the presence or absence of certain admired or condemned emotions and social attitudes — or, when it turns to the more objective aspect, it is more often interested in the 'fitness' of the act to the proprieties of the situation — than it is in the end of the act. In the current code, *e. g.*, profanity and obscenity are 'morally' reprobated, not, seemingly, because the user of such modes of speech is supposed to aim at bad ulterior ends, but because of a felt ugliness or 'vulgarity' in the state of mind presupposed by such speech. Ordinary ethical thought, indeed, seems more often than not to forget the teleological meaning of volition; it is concerned less with what choices come *to* than with what they come *from*. Sharp does not seem to me to do justice to the importance of the quasi-aesthetic type of moral judgment, nor to recognize sufficiently how implicit in much self-judgment (which should be treated in such a study as a separate phenomenon) is a subtle histrionizing, an appeal to Adam Smith's imaginary and impartial spectator. This seems due partly to an insufficient preliminary consideration of the methodological difficulties of Sharp's undertaking — which is, not to set forth how people ought to make moral judgments, but how they actually do. It is hard, in such an inquiry, to make sure that one has taken account of the whole relevant range of variation in mental processes, and in the use of such terms as 'moral,' 'right,' *etc.*; and it is hard not to slip over from an analysis of the implicit meaning of people's thinking in these matters to a statement

of what they *would* think if they thought quite rationally and consistently. I am not sure that Sharp always escapes this illicit transition. — Of ethical interest also is Mr. Robert A. Wood's essay, 'Democracy a New Unfolding of Human Power,' which, however, consists rather in fine-spirited and stimulating 'moral ideas' than in 'ideas about morality.' It is, perhaps, from this point of view no demerit in the paper, that its writer's faith in the practicability of the extension of democracy (which he hardly very clearly defines) to new fields — *e. g.*, to industrial organization — rests chiefly upon the evidence of things not seen among the present facts of social and industrial experience. — Dr. E. L. Norton contributes an interesting and instructive study of a comparatively neglected question, the nature and relative importance of the 'intellectual' (*i. e.*, the relation-apprehending) factor in musical appreciation. Though placed in the philosophical part of the volume, the paper falls rather, for its adequate consideration, within the province of the psychological aesthetician.

Two articles on pragmatism deal rather with certain historical relations of the doctrine than with its logical value. Professor W. L. Raub contends that pragmatism is identical, in substance, with Kantianism; *i. e.*, with the doctrines of the *Transcendental Æsthetic* and *Analytic*. An exceptionally clear and scrupulously well documented summary is given of the pragmatic epistemology. But the proposed parallelism can hardly be made out. It is impossible to discuss here all the suggested similarities; but one may remark that to hold a given principle (*e. g.*, the application of a given 'form' or category) to be an *a priori* condition of all possible experience is not the same as holding it to be *useful* in the *reconstruction* of an immediate experience in order to allay a felt dissatisfaction. Some pragmatists, it is true — even Professor James, among them — have gone to singular lengths in admitting that there exist *a priori* truths which are for us genuinely necessary, *i. e.*, intellectually ineluctable. And by citing these expressions Dr. Raub is able to make James and others appear incongruously enough among the prophets of Kantianism. But what this means is not that Kant was a pragmatist, but that some pragmatists have in moments of inconsistency gone back to Kant. Surely (unless the programme of pragmatism requires a general preliminary deliquescence of all logical distinctions) we have a right to ask that those who call themselves radical empiricists shall abstain from the use of necessary and *a priori* truths.¹ The concluding paper of the group, by Professor E.

¹ It will not do for such 'soft' pragmatists to take a leaf out of Mr. Spencer's book, and say that what were once mere voluntary postulates, selected because

W. Lyman of Bangor Theological Seminary, points out a contemporary *rapprochement* between theology and philosophy through the growth of the historical method on the side of theology, and of a pragmatic theory of knowledge on the side of philosophy.

ARTHUR O. LOVEJOY.

WASHINGTON UNIVERSITY, ST. LOUIS.

Studies in Philosophy and Psychology. Commemoration Volume presented to Professor CHARLES EDWARD GARMAN by his Former Students. Part II. Psychology, comprising:

Influence of Surrounding Objects on the Apparent Direction of a Line. EDMUND B. DELABARRE. Pp. 239-295.

Beginning a Language; A Contribution to the Psychology of Learning. EDGAR JAMES SWIFT. Pp. 297-313.

An Appeal from the Prevailing Doctrine of a Detached Subconsciousness. ARTHUR HENRY PIERCE. Pp. 315-349.

The Cause of a Voluntary Movement. ROBERT SESSIONS WOODWORTH. Pp. 351-392.

An Experimental Test of the Classical Theory of Volition. CHARLES THEODORE BURNETT. Pp. 393-401.

The method of the experiments reported in the first paper was to require the observer to set a straight line so that it seemed to him to be in a vertical or horizontal position. Its departure from the true vertical or horizontal was then measured. In some cases the line was a single luminous line in a dark field. This, however, can not be regarded as a standard case with which to compare other cases, for the results show that the amount of departure of this line from the true vertical or horizontal was in excess of the departure of lines set in a field containing a great variety of other visual objects. This result, the author explains, is due to unavoidable and changing complexities in even the simplest fields of vision. After making tests with a luminous line in a dark field, a great variety of modifications of the field were introduced. Figures of all forms and colors were introduced at the right and left, or above and below the line. Thus, distracting objects were, in some cases, single bright spots placed at various distances, or more elaborate figures or lines. The results of the experiment are presented in

of their survival-value, have now become necessities of thought. For that hypothesis is not merely intrinsically unverifiable, but is, according to its own terms, inconceivable. If the opposite of a given proposition cannot be conceived, it, *ipso facto*, cannot be conceived to have once been inherently conceivable.

numerous tables. In general, it may be said that the presence of distracting objects in the field may affect the apparent direction of the line in such a way as to cause either a positive or negative deflection, that is, a deflection toward the object or away from it. These influences exerted by various objects are also quantitatively of the greatest possible variety.

With results of such complexity before him, the author attempts to reduce all the different cases to a single principle of perception. The important consideration, according to his view, is the direction of attention. If attention is drawn toward the object in the field of vision, the line will also be deflected toward the object. If, on the other hand, the effort to resist the distraction of the object is strong enough to attract the attention away from the object, the line will be deflected away from the object. In attempting to reach some definition of the nature of what is here called attention, the author after excluding other possibilities comes to the following general conclusion: "The only view that appeals to me as at all adequate to account for the facts is that the variations in the line's apparent direction are due to the presence of particular muscular tensions" (p. 286).

From what has been said of the results of the investigations it is obvious that no single type of muscular tensions can be made to serve as the explanation of all the results. After stating the general principle, above quoted, the author makes little reference to his tables. He takes up chiefly certain evidences drawn from introspection and concludes his explanatory discussion as follows: "But the full explanation involves so many intricacies that I must postpone its further elaboration. Just now I must content myself with the statement that I know that muscular tensions of this nature exist and modify the apparent direction of lines; and with expressing my belief that they furnish the ultimate explanation of all the spatial facts recorded in this paper" (p. 287).

The value of this theoretical conclusion is somewhat limited, because the author has not made any effort to meet the large body of evidence that has recently been gathered from photographs of eyes, adverse to his introspection and theoretical conclusions. The empirical results of the investigation confirm very fully the well recognized general principle, that every part of the field of vision is interrelated with every other part, so that perception of any line in the field of vision is a general and highly complicated process of perception.

The second paper, on the learning of language, continues the line of work which Swift has reported in earlier papers. In this experi-

ment the author has undertaken to determine quantitatively the progress which he made in learning the exercises in a primer of the Russian language. He had no acquaintance, prior to the beginning of the experiment, with Russian; and his determinations, from the nature of the case, are very similar to the determinations which might be made on a child learning some complex subject in the school. The results of the investigations are presented in a curve which shows the usual irregularities and plateaus of all practice curves. In his discussions of the results the author explains some of the most striking irregularities in the curve; and in conclusion he undertakes some theoretical interpretations of the nature of the habit under investigation. He repeats the argument which he has presented in an earlier paper, that the 'habit hierarchies' of Bryan and Harter are not as distinct as the earlier authors indicated in their paper on telegraphic language. The different constituents of a habit are probably all present in some degree from the first. The more complex habit factors are less pronounced at the beginning of the experiment and gradually come into the ascendancy. Their final development is what gives the distinctive character to the later periods of the curve after the plateaus have been passed.

The third paper, by Prof. Pierce, is a critical discussion dealing with the use made by various writers of the concept of subconsciousness. The first part of the paper deals with various possible definitions of the term. The second part reviews very briefly the evidences upon which authors depend for the assumption of the existence of the subconscious. Third, there follow certain questions which indicate so clearly the critical attitude of the author that one or two quotations may be made from these questions. For example, the following question is raised: "Is the subconscious supposed to have a cerebral basis?" (p. 324). Again, "Does the term 'subconsciousness' refer to an hypothesis submitted for the explanation and interpretation of certain observed facts, or does it stand for a demonstrable and already demonstrated reality?" (p. 325).

In the fourth part of the paper there follow a number of discussions which take up the matter in detail. Here the author has attempted to show that there is no evidence whatsoever for the assumption of a separate subconsciousness to explain automatic writing. Such activity is nothing more nor less than a complex form of that which can be observed in our ordinary habitual processes of controlling the hand in writing. Crystal vision and the insights of genius are only the development into clearly conscious processes of impressions

which have been presented in the field of partial attention, or have been worked out through fortunate series of associations and thus represent merely the products of automatic cerebral fusion. Sub-consciousness should, therefore, be treated as synonymous with brain activity wherever it is intended as a valid scientific hypothesis.

The paper by Professor Woodworth is a good illustration of a series of systematic observations made under carefully prepared conditions. A number of simple voluntary movements were executed by trained observers. The observer was required in each case to discover, if possible, the exact character of the mental state which preceded the movement.

The conclusions of the series of observations were very largely negative. It is shown clearly that kinæsthetic images are not present in the majority of cases. It is shown, in the second place, that no image of any kind, either visual or tactual, is required as a cue for voluntary movement. It is shown, in the third place, that the content of consciousness just prior to the movement is very frequently altogether too inadequate to account for the particular movement which is later executed. These negative conclusions having been established and elaborated by a careful discussion of the observations reported, the author does not make very clear what are his positive explanations of the necessary antecedents of voluntary movement. Certain suggestive hints are thrown out, as shown in the following sentences, which may be quoted: "In short, the nervous system may become set or adjusted for a certain act, and remain so for a time without a continuance of clear consciousness of the act; or the system may be so set as partially to determine the act, the complete determination being effected in a subsequent moment" (p. 389).

Again, in a following paragraph this statement is made: "The complete determinant of a voluntary motor act—that which specifies exactly what act it shall be—is nothing less than the total set of the nervous system at the moment. The set is determined partly by factors of long standing, instincts and habits, partly by the sensations of the moment, partly by recent perceptions of the situation and by other thoughts lately present in consciousness" (p. 391).

This paper, in common with a number of recent investigations, calls attention very clearly to the importance of treating movement as a subject for vigorous psychological examination; and it also makes impossible the former easy-going discussion of the relation between volition, sense impressions, and mental imagery. The relation under discussion is one of the very first importance for psychological explana-

tion, and obviously, from such observations as those here elaborated, it is one of the most difficult experiences for complete introspective analysis."

The last paper of the series, by Dr. Burnett, deals with much the same problem as that taken up in Professor Woodworth's paper. The result is summarized by the author as follows: "The results of the foregoing experiments seem to indicate that in the limited field under consideration, that of voluntary movements of the back-and-forth type, the imagination of neither resident sensations from the limbs nor of remote sensations as from the eye, ear, or skin, showing how the moving part looks or sounds or feels, can furnish an adequate cue for the occurrence of actual movements at a maximum rate" (p. 401).

This conclusion is based on a series of tables in which the rate of imagined movements is compared with the rate of real movements. The rate of imagined movements is reported as slower than the rate of real movements; and this leads the author to the general conclusion that the imagined movements cannot serve as the cue to the real movement.

Unfortunately the statement of the method of the experiments is so curtailed and the meaning of units in the table so obscure that it is quite impossible to understand how the data were obtained. The experiments are on a subject of such importance, and the conclusions seem to be so fully established in the author's mind, that it is doubly desirable that the character of the experiments be made clear.

CHARLES H. JUDD.

YALE UNIVERSITY.

PHILOSOPHY OF EXPERIENCE.

Avenarius' Philosophy of Pure Experience. NORMAN SMITH. Mind, April, 1906.

While Avenarius discovered a genuine fallacy in the introjectionist argument, Mr. Smith believes that both his account of its origin, and the applications which he derived from it, are open to serious objections.

In *Der Menschliche Weltbegriff*, Avenarius attributes all the distinctions between inner and outer, self and not-self, subject and object, and soul and body, to the fallacy of introjection, and accordingly repudiates them in the interests of his own doctrine of 'pure experience.' In reply, it is maintained that these distinctions are not only legitimate, but that they do not owe their origin to introjection. The

distinction between objects and our perception of them must first have been present in our own consciousness, before we could have begun to infer it in others, and so started the process of introjection. These dualisms really owe their origin simply to the spatial externality of objects to our own bodies. Avenarius is not justified in finding an instance of introjection in the animism of children and savages. Tylor has satisfactorily explained the origin of animism in a much simpler manner, as the natural interpretation of certain concrete phenomena, viz., sleep, dreams, and death. Nor can animism be regarded as the cause of these dualisms, though it is a crude attempt to explain them, and leads to more fruitful and absolutely legitimate philosophical developments.

In some later articles published in the *Vierteljahrsschrift*, Avenarius charges the source of subjective idealism to the introjectionist fallacy. While Mr. Smith believes that subjective idealism logically presupposes some such fallacious alternation between an assumed realism and idealism, and that Avenarius has performed a valuable service to philosophy in showing this, he maintains that Avenarius is wrong in attributing the origin of subjective idealism to introjection. Its origin is a purely philosophical development, based upon the physical and physiological difficulties involved in explaining the relationship of matter and consciousness, and it did not appear until the age of Descartes, at least in an at all definite form.

W. K. WRIGHT.

UNIVERSITY OF TEXAS.

The Experience-Philosophy. WARNER FITE. *Phil. Rev.*, 1906, XV., 1-16.

The chief purpose of this article is to show that the experience-philosophy, resting as it does upon the proposition that experience is immediately given and prior to the world of things, exhibits a serious fallacy. The series of experiences and the present experience are found to be intimately connected with and determined by things in space and time. (1) The *past* experience and the past fact not in experience are both mediated, the one by memory and the other by inference. Both processes, however, turn out to be objective; for the criteria of a true memory-picture are clearness, which stands for consistency of external detail, and the 'personal character,' consisting in definite bodily relations existing between the subject and the perceived object, to which the purely subjective element of experience is always subordinate. (2) The real *present* experience is distinguished from

the imagined experience by a greater degree of clearness, and clearness refers, we have found, to coherency of mechanical relations. Even the subjective aspect of the present experience depends upon objective conditions. Thus the world of experience is inseparably united with the world of things, and the experience-philosopher by limiting reality to the former assumes a fallacious position. In rejecting experience as exclusively valid we do not accept the external fact as the ultimate. Neither is an absolute datum, and the search for one is futile and unnecessary. The reasonable course lies in accepting both the idealistic and realistic theories for the truth each contains, using a datum, not for a solid foundation, but for purposes of further investigation.

Two criticisms may be suggested, though there is not space in which to develop them. First: the two phrases, 'the world as experience' and 'the world as my idea,' are incorrectly treated as equivalent; and second, it does not seem to the writer of this notice that Dr. Fite succeeds in his attempt at placing 'experience' and the 'thing outside it' upon an equal footing: on the contrary, he 'derives experience from the world.'

HELEN GARDNER HOOD.

WELLESLEY COLLEGE.

MEMORY.

Ueber Sinnesempfindungen und Gedächtnisbilder. VICTOR URBAN-TSCHITSCH. Archiv f. d. ges. Physiologie (Pflüger's), 1905, CX., 437-491.

While this paper records observations upon after-sensations and memory-images in each of the sense realms except the olfactory, kinæsthetic and organic, the chief interest attaches to the phenomena observed in the fields of audition and of temperature sensation. After listening to a tuning-fork, six out of ten observers were able to detect after-sensations which, in the case of three observers, differed in pitch from the normal tone by a few vibrations. The objective and subjective tones sounding together could be heard as distinct but did not beat. In each of the sense realms, details not detected in the original sensation are discoverable in the after-sensation. In this connection the author reports his studies upon the hard-of-hearing, in whose experience auditory after-sensations and memory-images are of unusual importance. Localization of sensations is treated at length, the conditions affecting the spread of temperature sensations and after-sensations being described most fully. The article contains no bibliography and no discussion of the work of other experimenters.

W. V. D. BINGHAM.

UNIVERSITY OF CHICAGO.

BOOKS RECEIVED FROM DECEMBER 5, 1906, TO JANUARY 5, 1907.

- The Psychic Treatment of Nervous Disorders.* P. DUBOIS. Trans. by S. E. JELLIFFE and W. A. WHITE. New York and London, Funk & Wagnalls, 1906. Pp. v + 466.
- Le Duplicisme Humain.* C. SABATIER. Paris, Alcan, 1907 (for 1906). Pp. xviii + 160. Fr. 2.50.
- Mental Development in the Child and the Race. Methods and Processes.* J. MARK BALDWIN. 3d ed. (7th printing). New York and London, Macmillans, 1906. Pp. viii + 477.
- Social and Ethical Interpretations in Mental Development.* J. MARK BALDWIN. 4th ed. New York and London, Macmillans, 1906. Pp. xxvi + 606. \$2.60 net.
- Lectures on the Methods of Science.* Ed. by I. B. STRONG. Oxford University Extension Lectures, 1905. Oxford, Clarendon Press; New York, Froude, 1906. Pp. viii + 249. [Lectures by nine Oxford authorities on a variety of topics not well covered by the title.]
- Le Mensonge de l'Art.* FR. PAULHAN. Paris, Alcan, 1907 (for 1906). Pp. 380. Fr. 5.
- Eine Untersuchung über Raum, Zeit, und Begriffe vom Standpunkt des Positivismus.* E. ZSCHIMMER. Leipzig, Engelmann, 1906. Pp. 54.
- Le Crime, Causes et Remèdes.* C. LOMBROSO. Paris, Alcan, 1907. Pp. xxiv + 583. 10 fr.
- Demifous et Demiresponsables.* J. GROSSET. Paris, Alcan, 1907. Pp. 297. 5 fr.

NOTES AND NEWS.

FURTHER particulars are at hand of the Institute recently organized by the German 'Gesellschaft für experimentelle Psychologie,' as announced in the November BULLETIN. The Institute is to be open from November 1 to February 28 and from May 1 to July 31, for the pursuit of investigations. The library and archives are accessible to all who are engaged in scientific investigation, whether members of the society or not; a moderate charge is made for consulting the ar-

chives, which under special circumstances will be sent to distant points for consultation. The committee in charge of the work consists of Professors G. E. Müller, Meumann and Sommer, and Drs. Stern (director) and Lipmann (secretary). Each topic of investigation undertaken will be in charge of a special 'Commission,' appointed by the Committee and consisting of the director and secretary and others interested in the particular subject, non-members of the society being eligible to membership on these Commissions. The working out of the scheme will be watched with interest by experimentalists in this country who are working for the cause of inter-laboratory coöperation.

WE have received the preliminary program of the Second International Congress of School Hygiene, to be held in London August 5-10, 1907. Among the Sections is one on 'The Physiology and Psychology of Educational Methods and Work.' (Office: The Royal Sanatory Institute, Margaret St., London, W.)

WE note also the announcement of an international course of lectures on Juridical Psychology and Psychiatry to be given at Giessen under the direction of Professor Sommer. The program includes twelve lectures by Professors Sommer, Aschaffenburg, Mittermaier and Dr. Dannemann.

DR. HENRY RUTGERS MARSHALL, of New York City, was elected president of the American Psychological Association, and Professor H. N. Gardiner, of Smith College, president of the American Philosophical Association, for the coming year. Reports of the December meetings of the Associations will appear in our next issue.

PROFESSOR HUGO MÜNSTERBERG, of Harvard University, is in Germany on a leave of absence extending from November to January.

IT is stated that Professor Guido Villa, author of the well-known work *Contemporary Psychology*, has been appointed to the chair in philosophy at Pavia made vacant by the death of Professor Cantoni.

DR. SHEPHERD IVORY FRANZ has accepted the position of psychologist in the Government Hospital for the Insane, at Washington, in addition to the professorship of physiology in the George Washington University.

AT the University of Toronto, Dr. T. R. Robinson and Mr. W. G. Smith, hitherto lecturers in philosophy, have been appointed assistants in the psychological laboratory also. M. F. L. Barber is instructor in philosophy and class assistant in the laboratory, and Miss M. Jansen, Ph.D., class assistant and librarian of the laboratory.

